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Introducción

El protocolo del Open Shortest Path First (OSPF) salva su anuncio del estado del link (LSA) en la base de datos OSPF. Este documento describe cómo el software del [®] del Cisco IOS maneja el externo OSPF (type-5) LSA que solapa.

Usted debe ser familiar con OSPF LSA como se utilizan dentro del Cisco IOS Software en los routers Cisco. El conocimiento básico del IP Addressing es también útil.

Nota: [La herramienta del Output Interpreter \(clientes registrados solamente\)](#) apoya los ciertos comandos show. Utilice la herramienta del Output Interpreter para ver una análisis de la salida del comando show.

Salida del externo LSA

Un externo LSA OSPF contiene la información importada en el OSPF de otros procesos de ruteo. Ésta es salida de muestra de un externo LSA OSPF.

```
R1#sh ip ospf database external 192.168.1.0

          OSPF Router with ID (10.0.12.1) (Process ID 1)

          Type-5 AS External Link States

Routing Bit Set on this LSA in topology Base with MTID 0
LS age: 924
Options: (No TOS-capability, DC, Upward)
LS Type: AS External Link
Link State ID: 192.168.1.0 (External Network Number )
Advertising Router: 10.1.23.2
LS Seq Number: 80000003
Checksum: 0x29D4
Length: 36
Network Mask: /24
  Metric Type: 2 (Larger than any link state path)
  MTID: 0
  Metric: 1
  Forward Address: 10.1.23.3
  External Route Tag: 0
```

En este ejemplo, el OSPF utiliza el estado ID (que del link es lo mismo que el número de red externa) para distinguir diverso LSA externo.

Ejemplo 1: Dos diversas rutas con el mismo número de red externa

Es posible tener mismo network number con diversas máscaras importadas en el OSPF de diversos Routing Protocol. Es decir, dos diversas rutas pueden tener el mismo network number pero diversas máscaras.

```
R1#sh ip route ospf
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
       + - replicated route, % - next hop override
The gateway of last resort is not set.
```

```
10.0.0.0/8 is variably subnetted, 3 subnets, 2 masks
O      10.1.23.0/24 [110/20] via 10.1.12.2, 00:24:06, Ethernet0/0
192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
O E2   192.168.1.0/24 [110/1] via 10.1.12.2, 00:20:57, Ethernet0/0
O E2   192.168.1.0/25 [110/1] via 10.1.12.2, 00:00:11, Ethernet0/0
```

En este ejemplo, el OSPF tiene que instalar ambos LSA en su base de datos. Para alcanzar esto, el OSPF instala el LSA recibido siguiente como su número del broadcast en vez de su network number.

```
R1#sh ip ospf database external

        OSPF Router with ID (10.0.12.1) (Process ID 1)

        Type-5 AS External Link States

Routing Bit Set on this LSA in topology Base with MTID 0
LS age: 53
Options: (No TOS-capability, DC, Upward)
LS Type: AS External Link
Link State ID: 192.168.1.0 (External Network Number )
Advertising Router: 10.1.23.2
LS Seq Number: 80000003
Checksum: 0x29D4
Length: 36
Network Mask: /24
Metric Type: 2 (Larger than any link state path)
MTID: 0
Metric: 1
Forward Address: 10.1.23.3
External Route Tag: 0

Routing Bit Set on this LSA in topology Base with MTID 0
LS age: 428
Options: (No TOS-capability, DC, Upward)
LS Type: AS External Link
Link State ID: 192.168.1.127 (External Network Number ) <----Broadcast Number
of 192.168.1.0/25
```

```
Advertising Router: 10.1.23.2
LS Seq Number: 80000001
Checksum: 0x35CA
Length: 36
Network Mask: /25
Metric Type: 2 (Larger than any link state path)
MTID: 0
Metric: 1
Forward Address: 10.1.23.3
External Route Tag: 0
```

Ejemplo 2:

En este ejemplo, se retira el LSA 192.168.1.0/24. Una vez que se pierde este LSA, el otro LSA (192.168.1.0/25) no está instalado con su network number sino está instalado con un número del broadcast.

```
R1#sh ip ospf database external

                OSPF Router with ID (10.0.12.1) (Process ID 1)

                Type-5 AS External Link States

Routing Bit Set on this LSA in topology Base with MTID 0
LS age: 1066
Options: (No TOS-capability, DC, Upward)
LS Type: AS External Link
Link State ID: 192.168.1.127 (External Network Number )
Advertising Router: 10.1.23.2
LS Seq Number: 80000001
Checksum: 0x35CA
Length: 36
Network Mask: /25
Metric Type: 2 (Larger than any link state path)
MTID: 0
Metric: 1
Forward Address: 10.1.23.3
External Route Tag: 0
```

Ejemplo 3: Nuevo LSA recibido

En este ejemplo, se recibe un nuevo LSA (192.168.1.0/26).

```
R1#sh ip ospf database external

                OSPF Router with ID (10.0.12.1) (Process ID 1)

                Type-5 AS External Link States

Routing Bit Set on this LSA in topology Base with MTID 0
LS age: 51
Options: (No TOS-capability, DC, Upward)
LS Type: AS External Link
Link State ID: 192.168.1.0 (External Network Number )
Advertising Router: 10.1.23.2
LS Seq Number: 80000001
Checksum: 0x2DD2
Length: 36
Network Mask: /24
```

```
Metric Type: 2 (Larger than any link state path)
MTID: 0
Metric: 1
Forward Address: 10.1.23.3
External Route Tag: 0
```

```
Routing Bit Set on this LSA in topology Base with MTID 0
LS age: 7
```

```
Options: (No TOS-capability, DC, Upward)
```

```
LS Type: AS External Link
```

```
Link State ID: 192.168.1.63 (External Network Number )
```

```
Advertising Router: 10.1.23.2
```

```
LS Seq Number: 80000001
```

```
Checksum: 0x39C6
```

```
Length: 36
```

```
Network Mask: /26
```

```
Metric Type: 2 (Larger than any link state path)
```

```
MTID: 0
```

```
Metric: 1
```

```
Forward Address: 10.1.23.3
```

```
External Route Tag: 0
```

```
Routing Bit Set on this LSA in topology Base with MTID 0
LS age: 1198
```

```
Options: (No TOS-capability, DC, Upward)
```

```
LS Type: AS External Link
```

```
Link State ID: 192.168.1.127 (External Network Number )
```

```
Advertising Router: 10.1.23.2
```

```
LS Seq Number: 80000001
```

```
Checksum: 0x35CA
```

```
Length: 36
```

```
Network Mask: /25
```

```
Metric Type: 2 (Larger than any link state path)
```

```
MTID: 0
```

```
Metric: 1
```

```
Forward Address: 10.1.23.3
```

```
External Route Tag: 0
```

Ejemplo 4: LSA retirado y nuevo LSA recibido

En este ejemplo, se retira el LSA 192.168.1.0/24, y se recibe un nuevo LSA (192.168.1.0/26). El nuevo LSA substituye el LSA aislado, y el OSPF puede instalar el nuevo LSA con su network number.

```
R1#sh ip ospf database external
```

```
OSPF Router with ID (10.0.12.1) (Process ID 1)
```

```
Type-5 AS External Link States
```

```
Routing Bit Set on this LSA in topology Base with MTID 0
LS age: 2
```

```
Options: (No TOS-capability, DC, Upward)
```

```
LS Type: AS External Link
```

```
Link State ID: 192.168.1.0 (External Network Number )
```

```
Advertising Router: 10.1.23.2
```

```
LS Seq Number: 80000003
```

```
Checksum: 0xAD8F
```

```
Length: 36
```

```
Network Mask: /26
```

```
Metric Type: 2 (Larger than any link state path)
```

MTID: 0
Metric: 1
Forward Address: 10.1.23.3
External Route Tag: 0

Routing Bit Set on this LSA in topology Base with MTID 0
LS age: 1362

Options: (No TOS-capability, DC, Upward)
LS Type: AS External Link

Link State ID: 192.168.1.127 (External Network Number)

Advertising Router: 10.1.23.2
LS Seq Number: 80000001
Checksum: 0x35CA
Length: 36

Network Mask: /25

Metric Type: 2 (Larger than any link state path)
MTID: 0
Metric: 1
Forward Address: 10.1.23.3
External Route Tag: 0

El Cisco IOS Software intenta instalar el LSA como su network number. Puede no poder hacer tan si, por ejemplo, el network number está instalado ya con una diversa máscara. En ese caso, el Cisco IOS Software instala el LSA nuevamente recibido como su número del broadcast en vez de su network number.